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colour, by transmuting them into a *Sal armoniac* by the mediation of an acid, as *spirit of Salt*, *spirit of Vitriol*, *Alum*, &c. and then subliming them till they be white, will cease to doubt of this matter. The reason of which change, I presume, is, because, though these volatile Salts carry over always some of the fetid oyl with them while in a state of volatility, yet being thus in a manner fixed, the fetid oyl must necessarily by force of fire rise first, leaving the subsequent compound Salt, or *Sal armoniac* without smell; though it is still a doubt, whether the volatile Salt is better or worse for this labour.

As to your Postscript concerning *petrescent Springs*, we have one near us, there is indeed a Cave some miles off, at the furthest end of which few have been; from the roof of which hang large drops of petrified water, like Icles, some of them reaching down to the ground like pillars, these icles are good Limestone, as I have tried.

I shall conclude when I have acquainted you with a Spirit of Sugar, of which a Distiller with us hath a quantity; it seems to be the result of some anomalous fermentation, it is so strong that no man is able to smell at it in an open vessel, without being made almost breathless: neither do I think the person that made it, can make it again. If it prove worth that consideration of the Noble *fr. Boyle*, I intreat a brief account of his thoughts concerning it, particularly whether it may be used internally or no, and whether it be a thing ordinary or extraordinary; for in truth I know not what to make of it. If it should prove Antiscorbutick, I hope those will retract their opinion, who deduce the *Scurvy* from the use of Sugar. Sir, Your, &c.

Postscript, *Extracted out of Dr. Hodgson's Letter to Dr. Gi'pin.*

THE Spirit of Sugar, here mentioned, was drawn from bare Sugar-water (which is nothing but the water wherewith the molds, aprons, &c. are washed) fermented with the scum. And it was so exceedingly volatile, that it would not be carried, but lost all its force in the carriage, though it was very well stopped.

An Account of some Books:

Roberti Boyle, *Nobilissimi Angli & Soc. Regiæ dignissimi Socii, OPERA VARIA*; Geneva, in 4^o. 1677.

THE Works of this Noble Author having been already given an Account of in these *Transactions*, at the several times when they came abroad singly; the Publisher, upon the looking over

over of this *Latin* Edition, shall only inform the Reader; 1. That this Edition hath been put out without the content and knowledge of the Author. 2. That the year in the Frontispiece thereof is one and the same, as if the several Books contained in this *Latin* Volume had been published in one year: and that the Enumeration of the several Treatises, made in the Catalogue of this *Lat.* Edition, is not according to the time, wherein they were first printed. For, the *first* of the Books mention'd in the said Catalogue was publish'd in *English* A. 1660; the *fifth* and *sixth*, A. 1661; the *second*, A. 1662; the *seventh*, A. 1664; the *fourth*, A. 1666; the *third*, A. 1670; the *eighth*, A. 1671; the *tenth*, A. 1672; the *ninth*, A. 1673. So preposterously are those Books ranged in this Catalogue and Volume: Which the Reader was to be inform'd of, that by comparing the several true *Dates* of the first Edition of this Authors works with the Books of others, since printed, the priority of the Experiments, and Considerations, respectively contained in them, may be truly stated. 3. That there is no mention made in the General Title, nor in any Advertisement, that these Books are all of them Translations out of *English*, in which Tongue the Author hath written them all. 4. That the book of the *Origin of Forms and Qualities*, and that of *Subordinate Forms*, are both omitted in this *Volume*, though they were printed, even in *Latin*, at *Oxford* ever since the year 1669; as they had been printed in *English*, A. 1667.

II. *An Account of several Travels through a great part of GERMAN-Y in four Journeys, &c.* By Edw. Brown, M.D. Fellow of the Coll. of Physic. of London, and of the R. Society. Lond. 1677. in 4^o.

THIS Learned and curious Author, having given us a relation of some remoter and seldom-travelled Countries of *Europe* in the year 1673; doth in this piece disengage himself of the promise, he made in the said Relation, of giving an account of *Vienna*; describing withal his Journey unto that place from *England*, by the *Belgick Provinces* and *Germany*; as also his Return from *Vienna*, by *Austria Trans-Danubiana*, *Moravia*, *Bohemia*, *Misnia*, *Saxonia*, unto *Hamburg*; therein giving chiefly an account of the Natural, Artificial and Topographical Observables; together with some Customs and Occurrences, which might be acceptable to the Inquisitive Reader, or serve as hints of further Inquiry, to such persons as may hereafter travel into those Parts.

We shall here take notice only of a few of those Observations, that are mention'd in this book: As, of *Lymphatick* vessels so

preserv'd, as to see *valves* in them ; of so great a number of Unicorns-horns (horns of a Sea-animal,) as that a magnificent Throne was built out of them in *Denmark* ; of some of those horns, of 10, and of others, of 15 foot long ; of a Vessel at *Heidelberg*, holding about 200 Tuns, and, instead of hoops, being built with large Kneerimber like the ribs of a ship ; and having, upon one side of it a handsom Stair-case to ascend to the top of the vessel, upon which top there is a Gallery, set round with balistres, 43 steps high from the ground ; of a large rough *Jaspis*-stone, lying in one of the Courts of the Emperors Palace at *Vienna*, about 9 foot diameter, dug out of a Quarry of *Saltzburg* ; of a fair Manuscript of *Ptolemy*, with the Maps drawn in colours ; the oldest MS. and true Exemplar of *Livy*, without distinction of Words or Sentences ; an old fair Greek MS. of *Dioscorides*, written 1100 years since ; these three rare Books, and many more are in the Imperial Library : Of a Knife swallow'd by a Peasant near *Prague*, which was 9 months in his stomach, and then safely cut out : Of some Silver-Mines near *Guttemberg* in *Bohemia*, which are affirm'd to have been wrought 700 years ; the Oar of them containing both Silver and Copper, and a *blew Earth*, which they meet with in digging, affording the best hopes of Oar : Of the Elector of *Saxony's* Repository, furnished with very many and considerable rarities both of Nature and Art ; among which, there are two large pieces of pure *Virgin-gold*, as it came out of the Mine, and a *Gun* shooting off 40 times without charging again : Of a Mine, call'd *Himmelfurst*, near *Fryberg* in *Misnia*, wherein hath been found Oar so rich, as in an 100 pounds weight to contain an 130 marks of *Silver*, that is, 65 pounds in the 100 : The richest Veins observed to be thinnest : Of a *Sulphur-oar*, some of which contains *Silver*, some *Copper*, and some both, in a small proportion : Of the *German*-manner of making *Brass* with *Lapis calaminaris* ; and of a very considerable Mine of this *Lapis* near *Aquisgran*, which is said to have been wrought 300 years, together with a full description thereof, &c.

III. Caspari Bartholini, *Thomas filii, Diaphragmatis structura nova, unà cum Methodo preparandi Viscera, &c.* Parisiis 1676. in 8o.

THE ingenious Author, having, in his Preface, declared his resolution only to consult Nature her self, and acquiesce in nothing but Experiment, which he thinks too many of the great professors of Anatomy have neglected to do ; begins in the Tract it self, with shewing, that the lapses of Authors both ancient and modern

modern, which are many, proceed from want of a due consideration both of the true entire fabrick of the parts, and also of their consent with one another, either by their connexion, or contents; many of them, from a light observation of a few circumstances, running presently to analogies.

To which purpose he instances, *first*, in the known distinction between principal and subservient parts; then, in the mistaken notion, as he supposes, about musculous flesh; he allowing nothing to be called flesh, but what is fibrous, soft, and contractile: And to other soft, but not fibrous, substances, which lie about the vessels of the *viscera*, &c. he leaves the usual name of a *parenchyma*; and asserting, with his famous Tutor *Steno*, that all the solid parts of our bodies, except the *parenchymata*, are nothing else but a texture of the same kind of fibres variously diversified; affirming, particularly, of bones (after *Steno*,) That they were first fluid, then tendinous, afterward cartilagineous, and lastly came by degrees to have their hardness and solidity. From hence he infers, that there are no similar parts but fibres, and the substance affused about them; since all parts, according to him, are resolvable into them: Which he endeavours to make out from the consideration of some of the more observable constituent parts and integuments of the body, laying down all as preliminary to demonstrate, that not only the Diaphragm, but all parts of the body, both solid and fluid, are moved by Motive fibres. Here he gives the definition of a *Motive fibre*, delivered by *Steno*, and positively affirms, that that motion belongs only to carneous fibres (whatsoever colour they are endued with, for he thinks redness is not essential to a carneous fiber as such) and takes both tendons, and bones, to owe their motion to those fibres; but believes both membranes and glandules insufficient for motion, which he also denies to the substance of the Brain.

From hence he descends to consider the structure of the *Diaphragm*; where first he taxes former Anatomists, both for affirming it to be one single muscle, and also for teaching, that the *Oesophagus* passes through the membranous parts of it; whereas he affirms, it passes through the carneous; declaring it to consist of two muscles; whereof the upper, at one of its extremities, adheres circularly to the ribs, at the other, passes into an *aponeurosis*, which makes the nervous center (so called) of the Diaphragm: The lower, *he says*, arises from the *vertebra* of the loyns, and ends in the same *aponeurosis*, neither proceeding from, nor having commerce with, the other, but by that *aponeurosis* asserting withal, that the two appendices of it are made up of several tendons, terminated in the several *vertebra*; that each of these muscles has peculiar vessels; and that the fibres of the upper part of the lower muscle are somewhat circular, both to make way for the *oesophagus*, and to constrict it; describing withal the site of the fibres, and shewing the difference between the fabrick of this part in men, and some brutes; observing also, that there is, on both sides, a continuation be-

tween some tendons of the upper of these muscles, and the transverse one of the *abdomen*; from whence he makes an ingenious supposition of a *trigastrick muscle*, as if it were (in each side) only one, made up of those two of the *diaphragm* and that of the *abdomen*, one of whose tendons is fixed to the *vertebra* of the loyns, and the other in the *linea alba*: From which connexion of muscles, in that supposition, he assigns the reason of the dilatation, and contraction of the *thorax* in Respiration. The probability of this notion he confirms, from the expansion of the transverse muscles over the *sacculi membranacei* of Birds, which he describes minutely, and renders a reason of their respiration, ascribing nevertheless the motion of those membranes not only to the muscles of the belly, but much to their proper carneous fibres.

This done, he considers the chief office of the *Diaphragm*, viz. Respiration; which he defines to be, A passive motion of the lungs, whereby, upon the dilatation, or contraction and straitning, of the *thorax*, they admit and expel the air, for the cooling the blood, and perpetuating its motion. And takes notice of two distinctions, one of *Galen*, who makes Respiration to be threefold, 1. *gentle*, from the bare motion of the *Diaphragm*; 2. *stronger*, from the concurrence of the intercostal muscles; 3. *lofty*, wherewithal the muscles of the *thorax* are concerned: Another of the Honourable Mr. *Boyle*, who makes but two branches of his distinction, one moderate from the *Diaphragm*, another quicker from the intercostal muscles. Then, against *Helmont*, *Fal-coburgius*, *Cartesius*, &c. he asserts that the lungs have some motion of their own, from the carneous fibres of the *trachea*; affirming, that though the semicircular cartilages of it are said, by the Learned *Diermerbroeck*, to be continued by membranes; yet that those reputed membranes consist of carneous fibres, and that they are transversely carried from one side of the cartilage to another: Withal he supposes, that the fabrick of these cartilages is the same within the lungs, and that they have these continued either by carneous fibres, or some that are analogous to carneous; upon the constriction of which cartilages (the motion of the breast concurring,) the air, according to him, is expelled, and room made for the admission of the blood from the heart, which upon their dilatation, and the readmission of air, is again extruded. Then, resuming his disquisition about the motion of the *Diaphragm*, having considered what others say concerning its ascent and descent, he concludes, that, when upon inspiration 'tis compressed into the *abdomen*, the *thorax* is raised, but in expiration being propelled upwards, it draws the breast, the breast presses the included air, this the surface of the lungs, whereby the air contained in the *vesicula* is expressed into the branches of the *trachea*, and at last by them driven forth.

Next, he endeavours to prove, that the motion of all the Humors as well as Solid parts, is due to motive fibres: Where first he ranks all the vessels in the body (which contain the humors) under two heads,

viz.

viz. The channel of the aliments, and the sanguineous receptacle; considering in both, *first*, their aptitude, both to conserve their respective humor before a secretion be made, and afterwards to receive other secreted humors; *secondly*, their construction in order to the several secretions to be made out of it; and reducing the several excretory vessels to their due classes; asserting withal, that all humors are secreted only by the mediation of peculiar strainers, which he takes every where to be glandules. Then, as to the motion of the humors, he will allow it to be only twofold; the *first*, Intestine, from whence their fluidity springs; the *other*, Translative, of a mass of them: Where he endeavours to refute the Learned Dr *Thrustons* tripartite division. This latter motion, which he terms their External, he ascribes to motive fibres, which he proceeds to demonstrate in both the kinds of vessels before named.

And first in his Channel of aliments, having again premised his distinction of its contents, into what is assumed by the mouth, and not yet altered, and what is secreted out of the blood, and mixed with that, in order to produce some alteration in it, he proposes to consider what influence the motive fibres of all the parts of it, whether they be concerned before or after secretion, have upon the humors belonging to it; and instances, *first* in the *Tongue*, whose use (after *Steno*) he thinks to be not so much for speech, as in order to the subaction and detrusion of the aliments; then in the *œsophagus*, which by means of its spiral fibres seems adapted to continue the motion begun by the tongue; next in the *Diaphragm*, through the carneous fibres of the lower muscle of which (according to his former assertion) the *œsophagus* passing, he supposes to be by that means further constricted: Where he endeavours to give an account of the *dyspnœa*, and such like affects, and also of the *singultus*, and obviates an objection that might be made, from the consideration of Birds, in which there is no such compression of the orifice from the diaphragm, by alledging, that the defect of it is supplied, first, by the carneous fibres of the *Craw* (describ'd, *he says*, by *Steno*) before the entrance of the meat into the stomach; then by the strong muscles of their stomach, together with the assistance of the little stones they swallow, which help to grind the meat there. Then he further considers, that by the help of the parts concerned in respiration, the exclusion of the aliments out of the stomach is assisted, and their protrusion farther continu'd; to promote which along the tracts of the intestines, and to cause a segregation of the purer parts of the chyle into the *vasa lactea*, the peristaltick motion yields its assistance: Where he takes occasion to vindicate his fathers doctrine about the Funeral of the Liver against the learned *Swammerdam*. Lastly he takes notice, that the chyle, once got into its receptacle, is, with the *lymphæ*, impelled up the *ductus thoracicus* into the blood, by means of the tendons of the Diaphragm, and pulsation of the intercostal arteries, between which the *ductus* lies.

In the sanguineous receptacle he likewise considers two kinds of contents, one whereof is the *Chyle*, which by various cribrations and circulations, at last comes to constitute the whole mass of blood; the other, the *Lympha*, which, having been secreted from it, is afterwards refunded to it. And, to explain how the motion, both of the whole mass of blood, and of the humors, to be secreted from it, depends upon the carneous fibres, he supposes a channel without beginning or end, from one part of which he supposes other channels to branch, and to return again circularly into it; all the branches in the mean while observing a proportion to that part of it, from whence he begins the division (describing it by two figures;) which he applies to the several parts, and the motion of the liquors through them. After which he undertakes to confute the opinion of some that think the Humours, by their effervescence, have a great hand in the contraction and dilatation of the heart, ascribing the business wholly to the motive fibres of that muscle. Then he touches upon the opinion of some, that the Arteries have a peristaltick contraction, but forbears to determine it: Only, seems to like Dr *Thruston's* conjecture, about the *Systaltick* motion of the circumjacent parts, for returning the blood along the veins to the heart; but adds, that it might with more probability be said, that the return of it by the veins, is not only from the propulsion of that which comes out of the arteries into them, but from the proximity of those two kinds of vessels, and the mediation of their coats; the dilatation of the arteries, in regard they all along joyn laterally to the veins, helping the protrusion of the blood from valve to valve toward the heart: And though they are separated in the lungs by the *bronchia*, yet the air upon inspiration (according to *Thruston's* ingenious supposition) does, he imagines, the same thing. Lastly, to confirm his assertion about motive fibres being the cause of this motion of the Humours, he cites *Malpighi's* observation, about the *cellula* of the spleen, where, because there is not a sufficient compression, the assused blood does, after a sort, stagnate.

From hence he proceeds to consider the Excretory vessels of this Receptacle. Among which, in the first place he reckons the Nerves, but leaves their farther consideration as too obscure: Next the Lymphatics, which (after others) he will have to arise from conglobated glandules. Of these vessels he affirms many to be in the Spleen, and shews his way to make them appear to view; He seems also to own some of them in the Liver, though *Malpighius* doubt of them; offers to shew those of the Kidneys to any that desire it; will not determine any thing concerning those, which *Swammerdam* supposes to proceed from the glandules of the intestines, if they are distinct from the *vasa lactea*, which he alledges he has once or twice found full of clear *lympha*, when he has opened the animal two hours after meat; but declares that he has discovered, (at least affirms, that he has not met with the same observation made by any other,) and in several subjects constantly

stantly found, some very large excretory lymphaticks, proceeding from the glandules of the Mesentery, and terminated in the receptacle of chyle, in the same manner as the trunk of the lymphaticks uses; which new vessels, *he says*, are, after and before the time of the distribution of the aliments, filled with *Lympha*; only declares himself not satisfied, whether they are successively filled with chyle and *lymphæ*, as the receptacle and thoracick *ductus* are: On the occasion of which discovery he urges several considerable doubts about the passage of the chyle into the receptacle, the *lymphæ*, and conglobated glandules (to be found in the book it self:) Then considers, whence the *lymphæ* is derived, and concludes it to proceed not from the animal spirits, but the blood; yet nevertheless supposes not any immediate *anastomosis* between the arteries and lymphaticks, but only that they have a communication by means of their strainers or some other parts of the body. The motion of this *lymphæ*, he (after his father) affirms to be from the circumference toward the center of the body; but think no body has assigned the cause of that motion, which therefore he attributes to a propulsion from the heart, which by means of its motive fibres continually propelling, with the blood, the matter to be secreted, (*and the blood as incessantly depositing some of this matter by means of the strainers into these vessels,*) this must constantly propel the former, to make way for it self; adding withal, that in regard these vessels are frequently wrapped about the veins, the motion of the blood along them may, by compressing the lymphaticks, accelerate the motion of their liquor.

From the same cause, *viz.* Motive fibres, he supposes the liquor of the conglomerated glandules may be discharged by their vessels. In which parts yet he conceives Nature's Art is very remarkable; and instances in the *parotis conglomerata*, the glandules of the cheeks, those of the palate, and the glandules of the *œsophagus* in Fowl; all which undergo a great compression, either from considerable muscles, papillary bodies, or cartilages, in order to a copious discharge of their liquor. As to the *succus pancreaticus*, and *bile*, he believes their excretion to be promoted by the compression of the muscles of the *abdomen*, and the motion of the diaphragm, according to *Malpighius's* opinion; and takes occasion to examine Dr. *Cole's* conjecture, about the way that he supposes the *vesicula fellea* may (perhaps) receive its liquor. Then mentions, and describes, a certain conglomerated glandule (lately discovered by *Josephus de Verney*) in Cows, at the side of the *vulva*, which he takes to supply the room of the *prostatæ*, and to excrete some liquor, *coitus tempore*; to which purpose, he says, 'tis invested with carneous fibres; and concludes with examining the Learned *Graeff's* assertion about some other glandules in the neck of the womb.

Having finished the Treatise, to oblige the Curious, our Author subjoyns a Discourse about His way of preparing the *Viscera*; concerning which, as to the preparation, contrivance, and use thereof, the Reader is desired to peruse the Account it self there given.

IV. *Longitud:*

IV. *Longitude found*, by Henry Bond Senior, Teacher of the Mathematics. London 1676. in 4^o.

THE Attempt and Pains of the Author of this Book are certainly very commendable, forasmuch as he endeavours to explain to us the Use of the *Inclinary Needle*, and in so doing makes it known to the world, that, as both the *Variation* and *Inclination* of the Needle were found out first of all in this Nation by two English men, Mr. Robert Norman and Mr. William Burrows; so he (our Author) hath now made it his business to apply it to an Use, formerly, for ought we know, not thought of, viz. To find the *Longitude*. Which how he performs and makes good, is left to the Sagacious Reader to judge.

Mean time, the Publisher is desired, here to take notice of a mistake committed in this Book, viz. in the page printed next after the Epistle to the Reader; where 'tis said, that *This Treatise hath been examin'd by six Commissioners appointed by the King, and the Truth of it affirmed to his Majesty*: Whereas of the six persons there named, the Right Honourable the Lord Viscount Brouncker, Chancellour to her Majesty, and President to the R. Society, declareth, that he never so much as saw this Treatise before it was printed, nor was ever present at any of the Meetings of the other Commissioners; the Quality of the report of whom concerning this matter the Reader will doubtless be acquainted with in due time.

V. The Royal Almanack: By N. Stephenson, one of his Majesties Gunners. London 1677. in 12^o.

THIS Almanack is a very useful Diary of the true places of the Sun, Moon, and other Planets; their Rising, Southing, and Setting; as also of High-water at *London-bridge*, with Rules to serve other places after the *New Theory* of Tides, and Directions of Sir Jonas Moore. To which are added the *Eclipses*, with a Table of Equations for the regulating curious *Pendulum-Clocks*, and Movements to the Sun: Likewise, a Table of the Suns right Ascension in time for every day at Noon, and of Thirty of the most notable Fixed Stars: Together with the Moons and the other Planets Appulses to the Fixed Stars, for the Meridian of *London*, in the year 1677; as also a *Transit* of *Mercury* under the Sun, calculated for *Octob. 28.* next. All done with great care and pains at his Majesties command.

Errat. p. 766. l. 14 & 15. r. *icles*; ibid. l. 22. r. *the Consideration.*

Imprimatur,

Decemb. 14.
1676.

BROUNCKER, P. R. S.

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